Tracker schedule & milestones

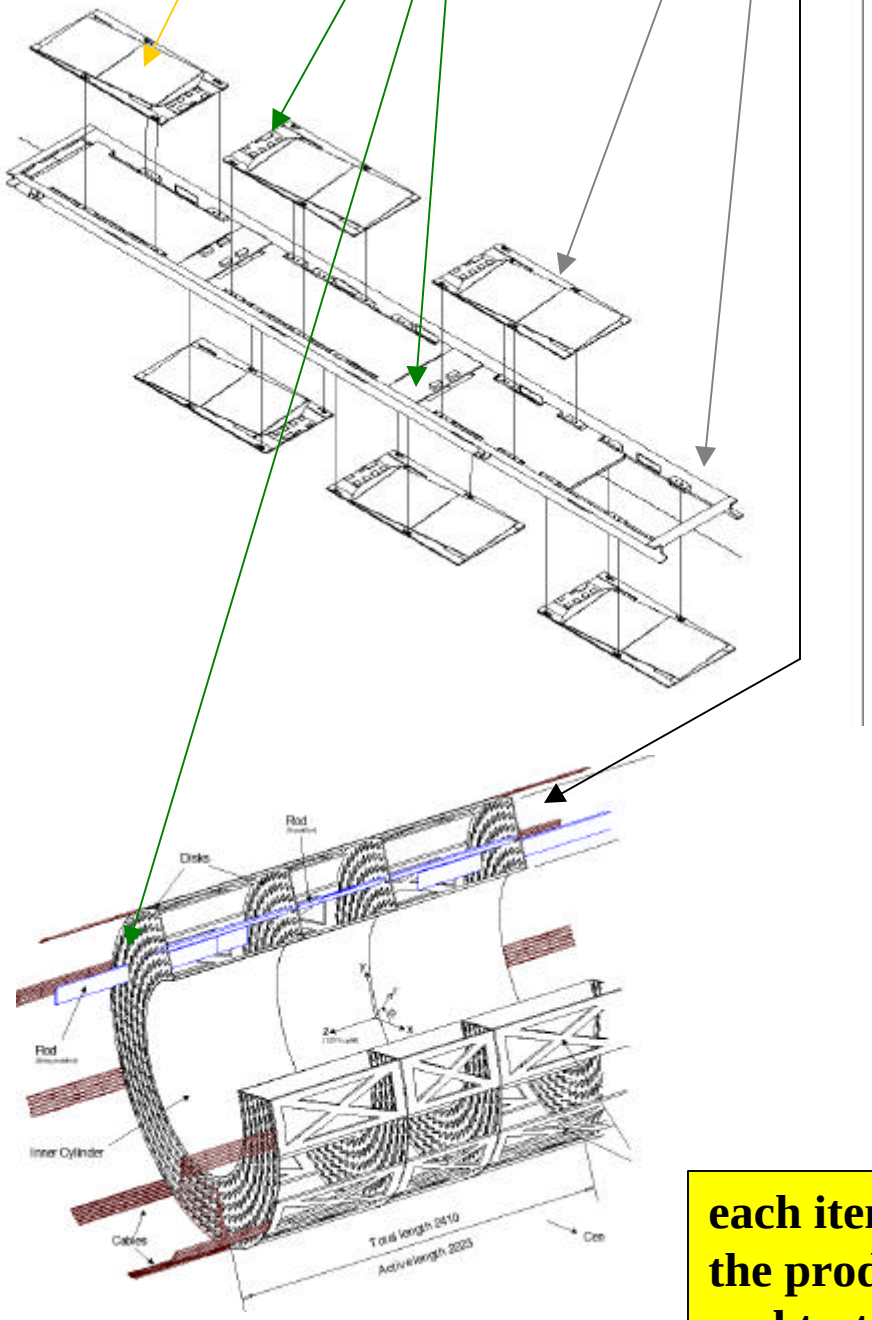
the present schedule (and its milestones list) comes from a deep analysis and re-evaluation of the Tracker

- **the definition of a new TK lay-out**
- **evaluation of new production schemas for the sub-detectors and for items that are common to the sub-detectors (like electronics)**
- **new conception in the assembly of detector-modules**
- **new way of assembly the different sub-detectors into the TK**

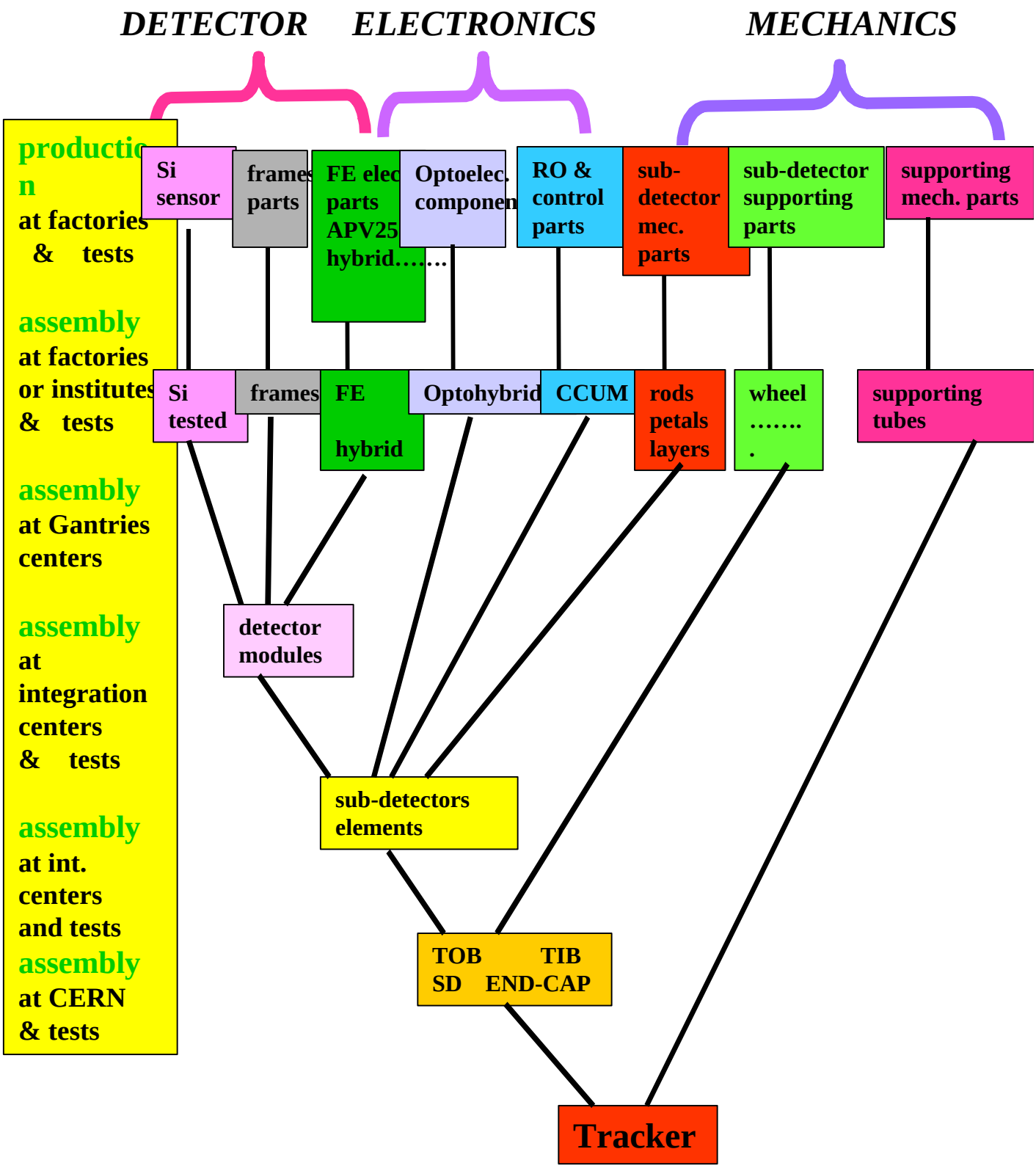
……. all this is seasoned with a new scheme of sharing of responsibility

for producing the schedule we started from
the identification of major categories of items

detectors **electronics** **mechanics** **others (external)**



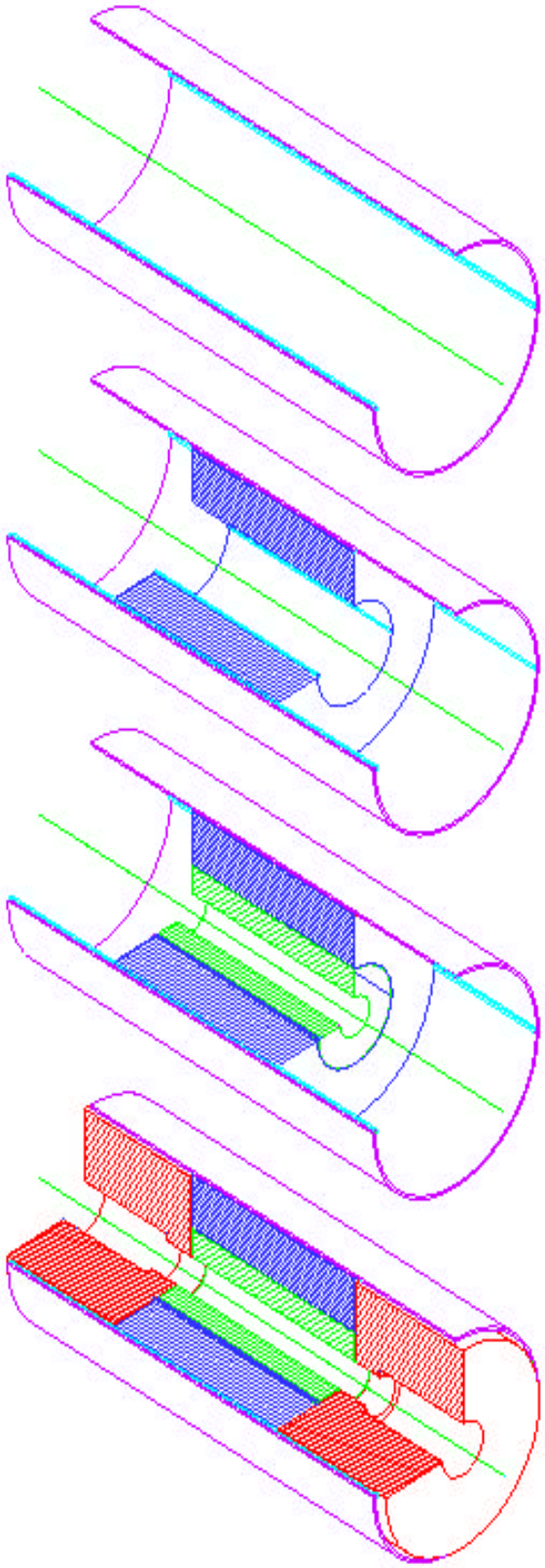
each item was identified the production/assembly and testing sequence was established


DETECTOR
ELECTRONICS
MECHANICS
production
at factories
& tests
assembly
at factories
or institutes
& tests
assembly
at Gantries
centers
assembly
at
integration
centers
& tests
assembly
at int.
centers
and tests
assembly
at CERN
& tests
Si sensor
frames parts
FE elec parts APV25 hybrid……
Optoelec. componen
RO & control parts
sub-detector mec. parts
sub-detector supporting parts
supporting mech. parts
Si tested
frames
FE hybrid
Optohybrid
CCUM
rods petals layers
wheel …….
supporting tubes
detector modules
sub-detectors elements
TOB TIB
SD END-CAP
Tracker

while producing the schedule we realized that:
we could gain in installation time and saefty by changing the TK assembly procedure (……. the production of some parts was anticipated by 2 years…….)

More time can be devoted to testing procedure!!!

Tracker assembly procedure at the surface



Supporting Tube
Thermal Screen
sliding rails

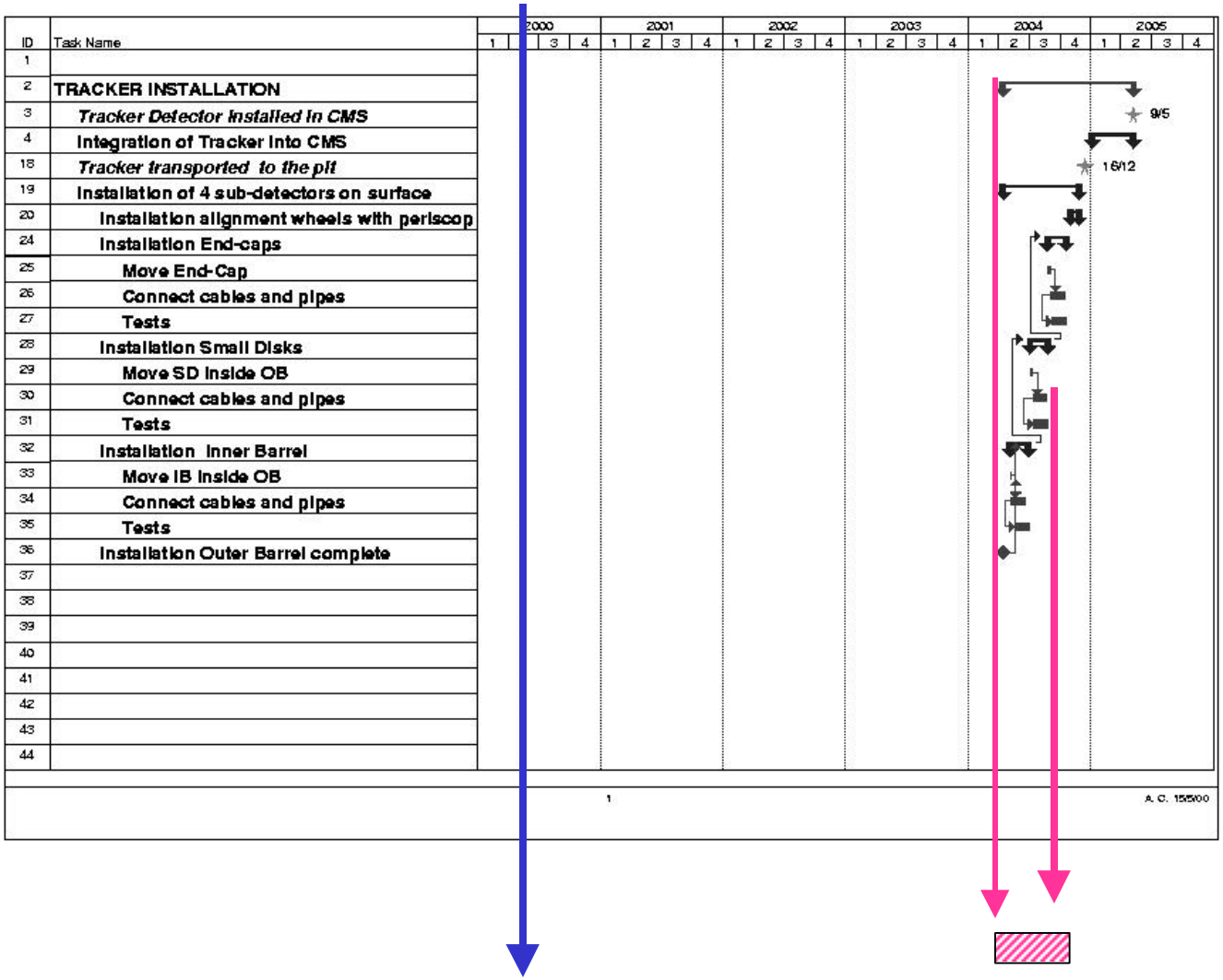
The Outer Barrel
is assembled in the ST

The Inner Barrel & the
Small Disk
are inserted in the OB

The End-Cap are
inserted in the ST

1 year

TK installation assembly TESTS & commissioning of services



ID	Task Name
1	
2	TRACKER INSTALLATION
3	*Tracker Detector installed in CMS*
4	Integration of Tracker into CMS
18	*Tracker transported to the pit*
19	Installation of 4 sub-detectors on surface
20	Installation alignment wheels with periscop
24	Installation End-caps
25	Move End-Cap
26	Connect cables and pipes
27	Tests
28	Installation Small Disks
29	Move SD inside OB
30	Connect cables and pipes
31	Tests
32	Installation Inner Barrel
33	Move IB inside OB
34	Connect cables and pipes
35	Tests
36	Installation Outer Barrel complete
37	
38	
39	
40	
41	
42	
43	
44	

end production of detectors, FE elect. mechanics

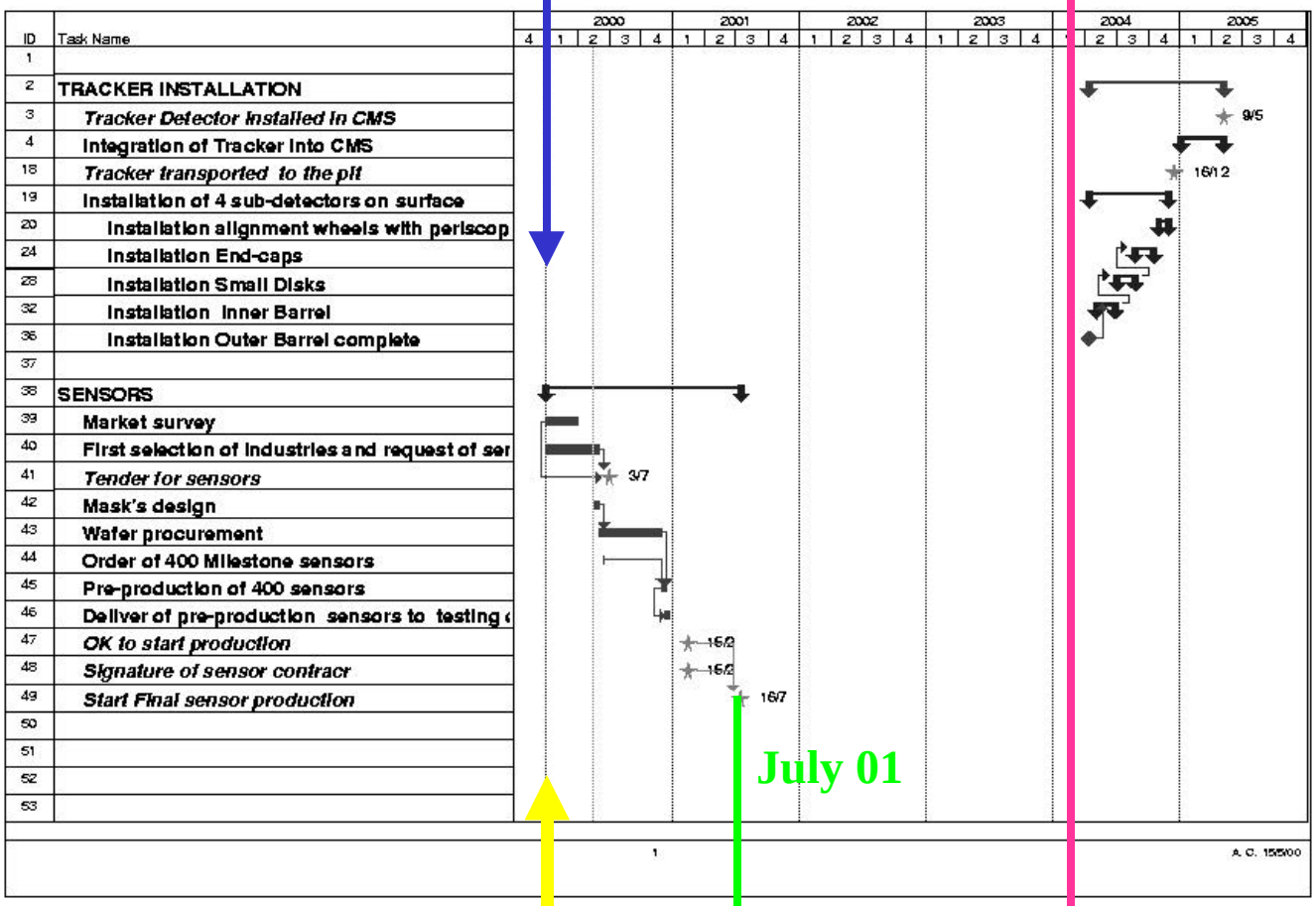
today with lay-out defined

module defined ⇒ **GO with tender & pre-production of sensors**

mechanics ~define ⇒ **start to produce final drawings & pre-production**

today with
lay-out defined

TK installation
assembly &
TESTS



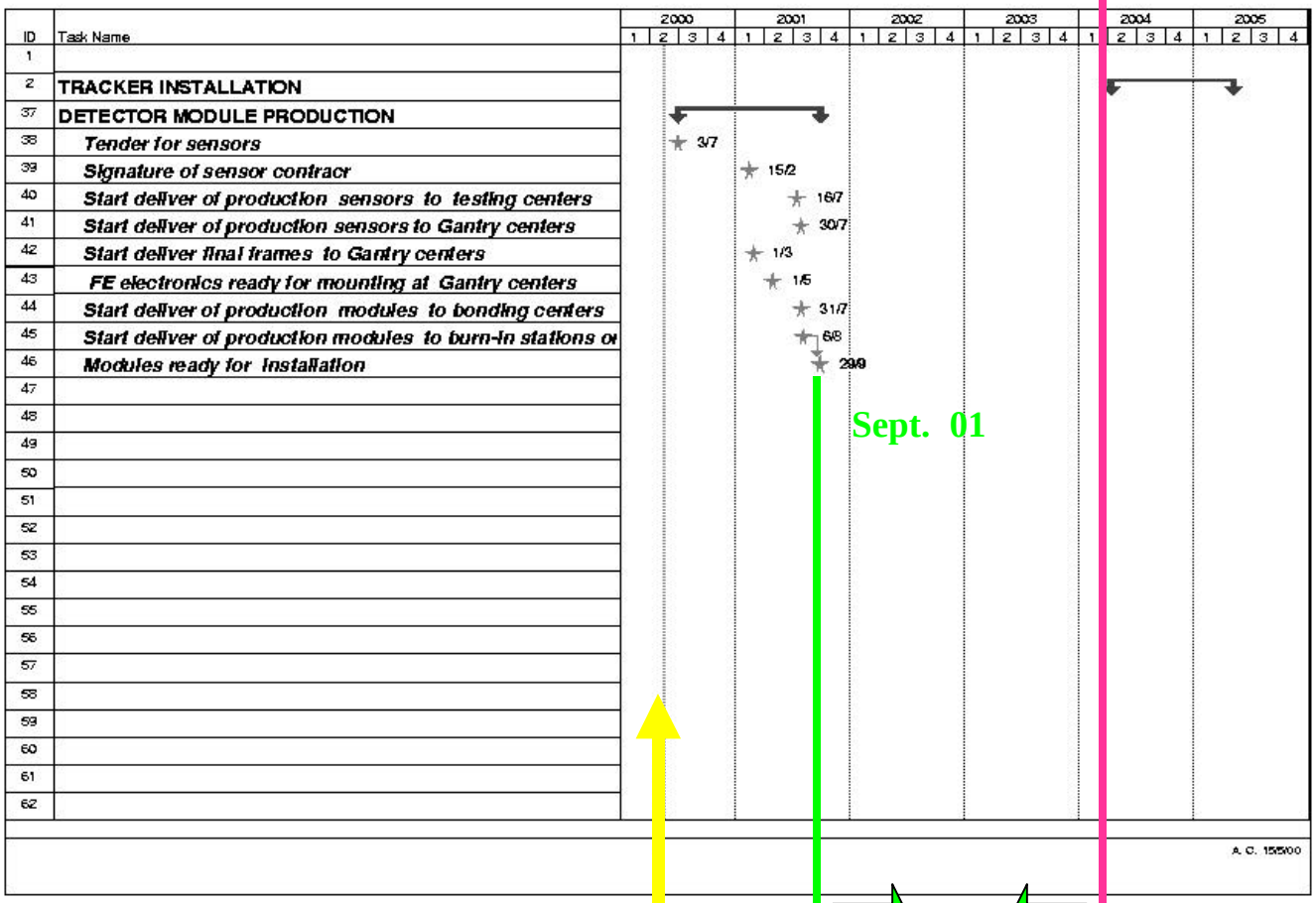
July 01

production of sensors &
assembly into modules
with electronics

FE electronics: READY
modules frame: READY
assembly centers: READY
testing centers: READY

TK installation assembly & TESTS

FE electronics: READY
modules frame: READY
assembly centers: READY
testing centers: READY



ID	Task Name
1	
2	**TRACKER INSTALLATION**
37	**DETECTOR MODULE PRODUCTION**
38	*Tender for sensors*
39	*Signature of sensor contract*
40	*Start deliver of production sensors to testing centers*
41	*Start deliver of production sensors to Gantry centers*
42	*Start deliver final frames to Gantry centers*
43	*FE electronics ready for mounting at Gantry centers*
44	*Start deliver of production modules to bonding centers*
45	*Start deliver of production modules to burn-in stations o*
46	*Modules ready for installation*
47	
48	
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62	

Sept. 01

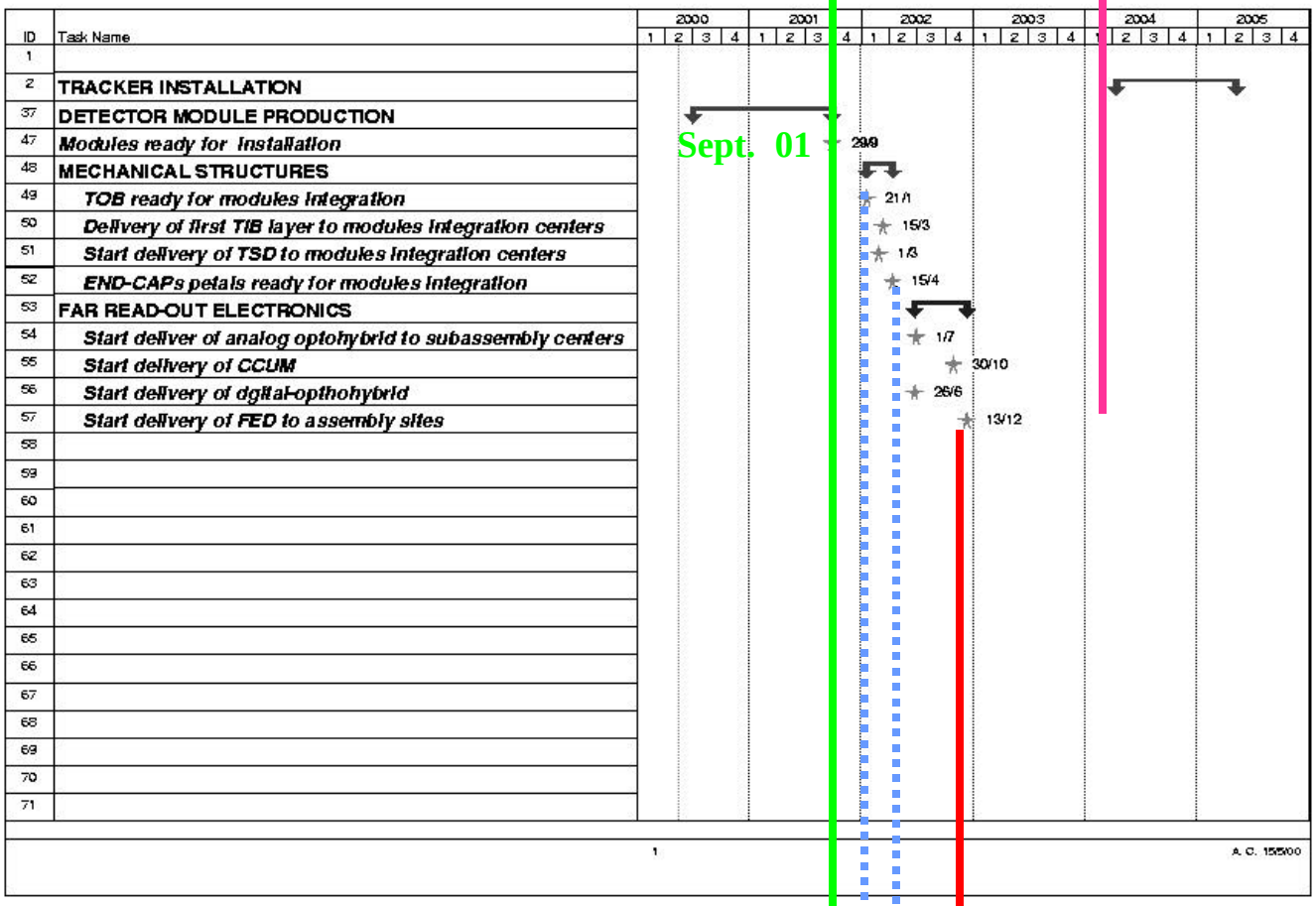
production modules integration of modules in the mechanics

rods: READY
petals: READY
IB layers: READY
Opto-electonic: READY

TK installation assembly & TESTS

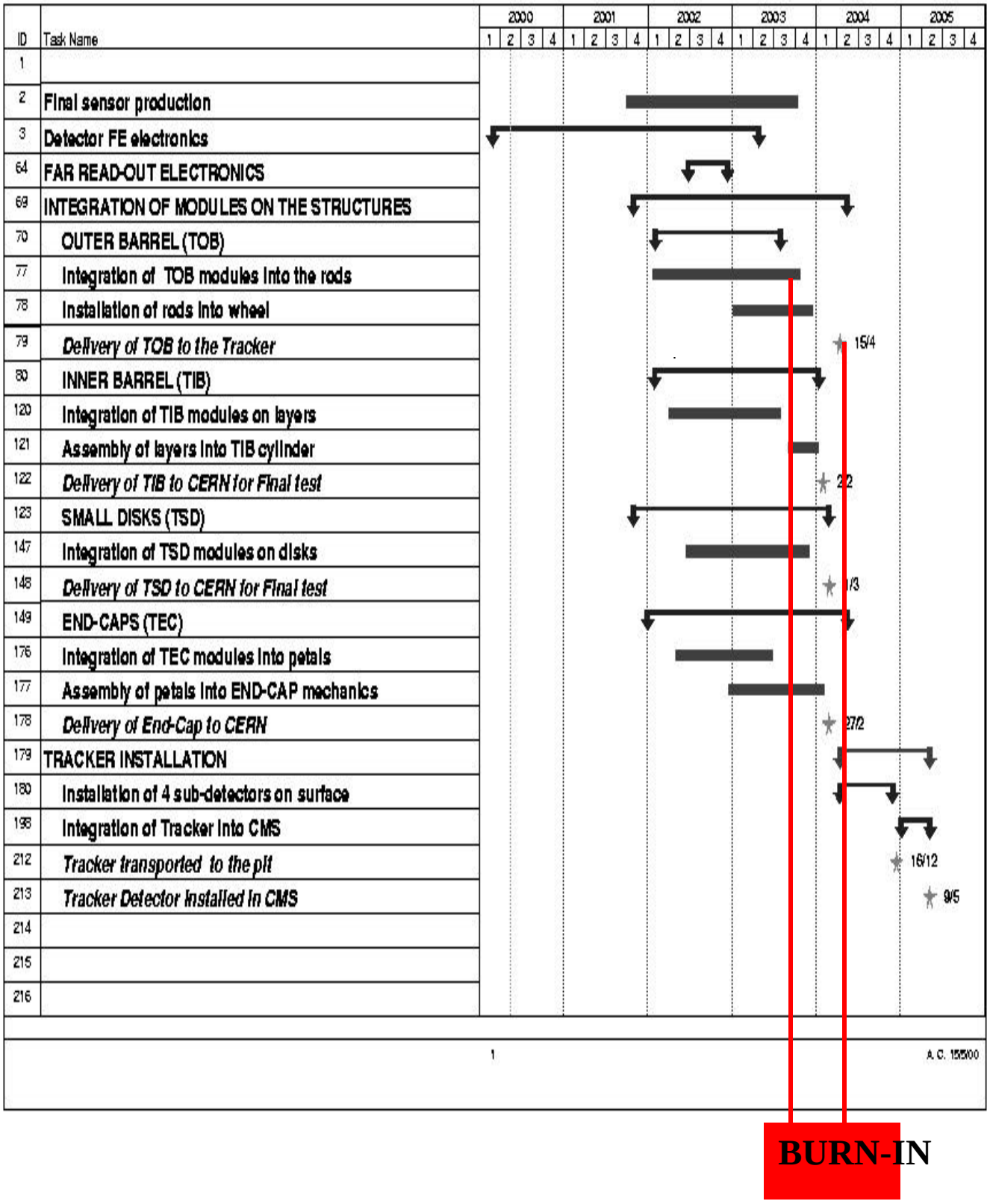
modules: READY 9/01

mechanic



late! to be re-evaluated to FIT HERE

production modules BURN-IN of modules integration of modules in the mechanics (when it is available)

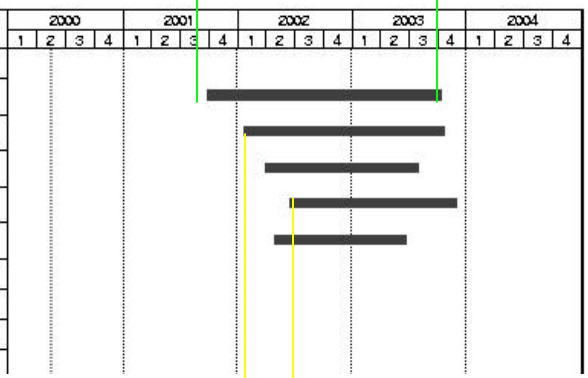

ID
Task Name
2000
2001
2002
2003
2004
2005
1 2 3 4
1
2 Final sensor production
3 Detector FE electronics
64 FAR READ-OUT ELECTRONICS
69 INTEGRATION OF MODULES ON THE STRUCTURES
70 OUTER BARREL (TOB)
77 Integration of TOB modules into the rods
78 Installation of rods into wheel
79 Delivery of TOB to the Tracker
15/4
80 INNER BARREL (TIB)
120 Integration of TIB modules on layers
121 Assembly of layers into TIB cylinder
122 Delivery of TIB to CERN for Final test
2/2
123 SMALL DISKS (TSD)
147 Integration of TSD modules on disks
148 Delivery of TSD to CERN for Final test
1/3
149 END-CAPS (TEC)
176 Integration of TEC modules into petals
177 Assembly of petals into END-CAP mechanics
178 Delivery of End-Cap to CERN
27/2
179 TRACKER INSTALLATION
180 Installation of 4 sub-detectors on surface
198 Integration of Tracker into CMS
212 Tracker transported to the pit
16/12
213 Tracker Detector installed in CMS
9/5
214
215
216
1
A. C. 15/5/00

BURN-IN

sensor production

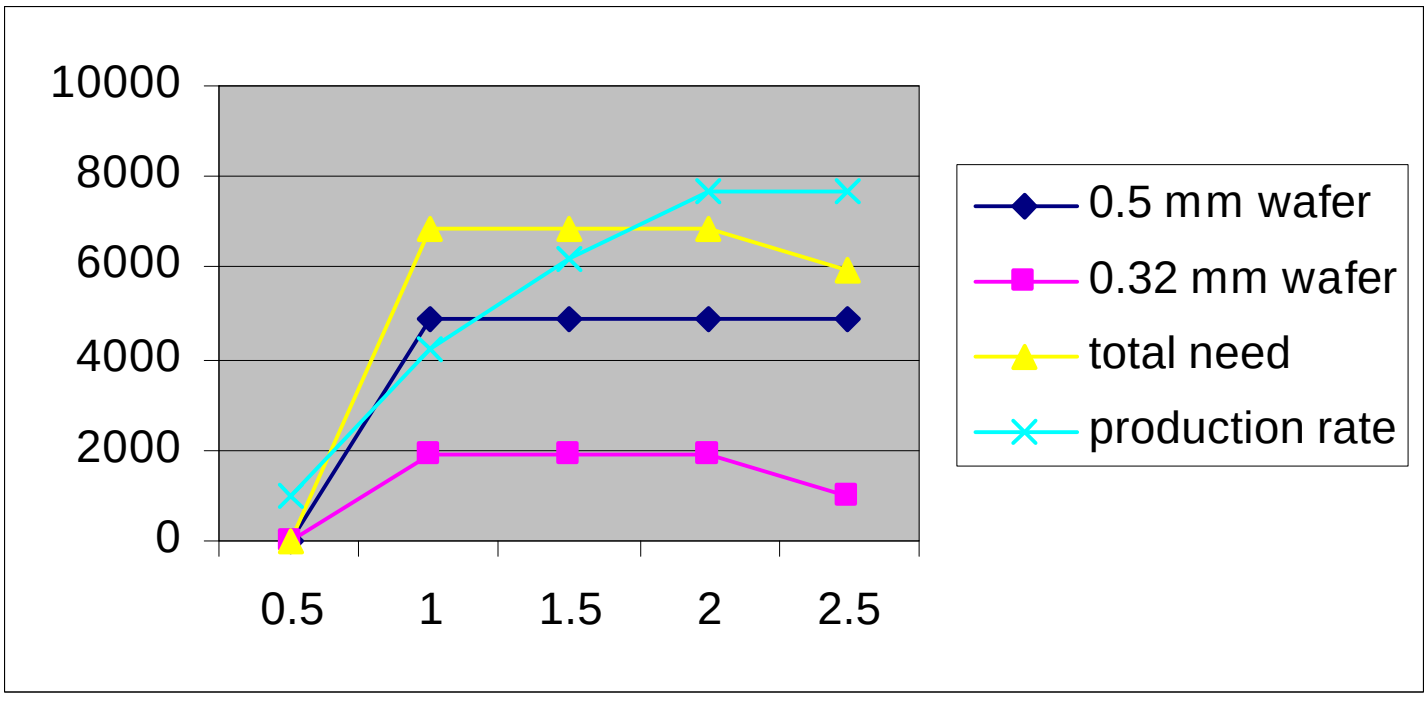
~2.5 y

ID	Task Name
1	
2	Final sensor production
3	Integration of TOB modules into the rods
4	Integration of TIB modules on layers
5	Integration of TSD modules on disks
6	Integration of TEC modules into petals
7	
8	
9	
10	



sensor integration starts later

with an offset of 0.5 y between the production of sensors and the integration of the modules into the mechanics with can handle the delivery rate foreseen in the survey



conclusions

This schedule has been produced in 3 months.

We think we have a reasonable understanding of the timing of the whole project

Some items have to be investigated and improved (like the Opto-hybrid and DCU)

We will tackle these weak point in the following weeks